

*A*³ Figures 8A-E demonstrate *in vitro* analysis of *de novo* and maintenance activities of Dnmt3a, Dnmt3b1 and Dnmt3b2 proteins.

In the Claims:

Please cancel claims 2, 11, 12, and 14-23 without prejudice or disclaimer of the subject matter therein.

{ Please substitute the following claim 1 for the pending claim 1: }

1. (once amended) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

- a. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 908 in SEQ ID NO:5;
- b. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 859 in SEQ ID NO:6;
- c. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 912 in SEQ ID NO:7;
- d. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 853 in SEQ ID NO:8;

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- AB
- e. a polynucleotide sequence that is at least 95% identical to the polynucleotide sequence of (a), (b), (c) or (d); and
 - f. a polynucleotide sequence complementary to the polynucleotide sequence of (a), (b), (c), (d) or (e).
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Please substitute the following claim 8 for the pending claim 8:

8. (once amended) An isolated nucleic acid molecule comprising polynucleotides selected from the group consisting of:

- AS
- a. at least 50 contiguous nucleotides of SEQ ID NO:1, provided that said nucleotides are not AA052791(SEQ ID NO: 9); AA111043(SEQ ID NO:10); AA154890(SEQ ID NO:11); AA240794(SEQ ID NO:12); AA756653(SEQ ID NO:13); W58898(SEQ ID NO:14); W59299(SEQ ID NO:15); W91664(SEQ ID NO:16); W91665(SEQ ID NO:17); or any subfragment thereof; and
 - b. a nucleotide sequence complementary to a nucleotide sequence in (a).

Please substitute the following claim 9 for the pending claim 9:

9. (once amended) An isolated nucleic acid molecule comprising polynucleotides selected from the group consisting of:

- a. at least 30 contiguous nucleotides of SEQ ID NO:2, provided that said nucleotides are not AA116694 (SEQ ID NO:18);

AA119979 (SEQ ID NO:19); AA177277 (SEQ ID NO:20);
AA210568 (SEQ ID NO:21); AA399749 (SEQ ID NO:22);
AA407106 (SEQ ID NO:23); AA575617 (SEQ ID NO:24);
or any subfragment thereof; and

- b. a nucleotide sequence complementary to a nucleotide sequence in (a).

Σ Please substitute the following claim 10 for the pending claim 10: Σ

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10. (once amended) An isolated nucleic acid molecule comprising polynucleotides selected from the group consisting of:

- a. at least 100 contiguous nucleotides of SEQ ID NO:3, provided that said nucleotides are not AA004310 (SEQ ID NO:25); AA004399 (SEQ ID NO:26); AA312013 (SEQ ID NO:27); AA355824 (SEQ ID NO:28); AA533619 (SEQ ID NO:29); AA361360 (SEQ ID NO:30); AA364876 (SEQ ID NO:31); AA503090 (SEQ ID NO:32); AA533619 (SEQ ID NO:33); AA706672 (SEQ ID NO:34); AA774277 (SEQ ID NO:35); AA780277 (SEQ ID NO:36); H03349 (SEQ ID NO:37); H04031 (SEQ ID NO:38); H53133 (SEQ ID NO:39); H53239 (SEQ ID NO:40); H64669 (SEQ ID NO:41); N26002 (SEQ ID NO:42); N52936 (SEQ ID NO:43); N88352 (SEQ ID NO:44); N89594 (SEQ ID NO:45); R19795 (SEQ ID NO:46); R47511 (SEQ ID

NO:47); T50235 (SEQ ID NO:48); T78023 (SEQ ID NO:49);
T78186 (SEQ ID NO:50); W22886 (SEQ ID NO:51);
W67657 (SEQ ID NO:52); W68094 (SEQ ID NO:53);
W76111 (SEQ ID NO:54); Z38299 (SEQ ID NO:55);
Z42012 (SEQ ID NO:56); G06200 (SEQ ID NO:74); or any
subfragment thereof; and

- b. a nucleotide sequence complementary to a nucleotide
sequence in (a).
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{ Please substitute the following claim 13 for the pending claim 13: }

13. (once amended) A method for *in vitro de novo* methylation of DNA,
comprising:

- a. contacting said DNA with a *de novo* DNA cytosine
methyltransferase polypeptide encoded by the nucleic acid
molecule of claim 1;
- b. providing an appropriately buffered solution with substrate
and cofactor; and
- c. purifying said DNA.
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{ Please add the following new claims: }

24. (new) The nucleic acid molecule of claim 1, wherein said polynucleotide encodes
a polypeptide capable of methylation at the C5 position of cytosine in DNA.

25. (new) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (a).

26. (new) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (b).

27. (new) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (c).

28. (new) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (d).

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29. (new) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (e).

30. (new) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (f).

31. (new) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

- a. a polynucleotide sequence encoding mouse Dnmt3a polypeptide contained in ATCC Deposit No. 209933;

- b. a polynucleotide sequence encoding mouse Dnmt3b polypeptide contained in ATCC Deposit No. 209934;
- c. a polynucleotide sequence encoding human DNMT3A polypeptide contained in ATCC Deposit No. 98809;
- d. a polynucleotide sequence encoding human DNMT3B polypeptide contained in ATCC Deposit No. 326637;
- e. a polynucleotide sequence at least 95% identical to the polynucleotide sequence of (a), (b), (c) or (d); and
- f. a polynucleotide sequence complementary to the polynucleotide sequence of (a), (b), (c), (d) or (e).

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32. (new) The nucleic acid molecule of claim 31, wherein said polynucleotide is that of part (a).

33. (new) The nucleic acid molecule of claim 31, wherein said polynucleotide is that of part (b).

34. (new) The nucleic acid molecule of claim 31, wherein said polynucleotide is that of part (c).

35. (new) The nucleic acid molecule of claim 31, wherein said polynucleotide is that of part (d).

36. (new) The nucleic acid molecule of claim 31, wherein said polynucleotide is that
of part (e).

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37. (new) The nucleic acid molecule of claim 31, wherein said polynucleotide is that
of part (f).

